

LANDFILL GAS EXTRACTION SYSTEM ADDITIONS AND MODIFICATIONS ATLANTA, GEORGIA

PROJECT MANAGER
DALE CARPENTER, CHMM

PERFORMANCE PERIOD
June 2006 – February 2007

CONTRACT VALUE
\$350,000

PURPOSE

Additions and modifications to the existing landfill gas extraction system.

HISTORY

The closed landfill is located in the southeast corner of the City of Atlanta. This landfill is the former site for the disposal of the City of Atlanta's municipal solid waste. The landfill has been closed, capped and a landfill gas collection system installed. Numerous groundwater impacts and methane gas exceedences prompted the City to enter into a Consent Order EPD-SW-2035 with the Georgia Environmental Protection Division to implement corrective measures. The City contracted with an engineering firm to design, implement and oversee these corrective measures. The engineering company developed a design package that included the installation of additional extraction wells and associated conveyance piping and modifications to the existing condensate collection system. Subsequently, the engineering company contracted



with Greenleaf Environmental Services to implement the design package.

PROJECT APPROACH

The scope of the work performed included:

- Installation of five 36" diameter extraction wells. These wells were installed to depths of 50 feet or greater. 8" HDPE piping was installed in each of the wells and each well was fitted with a 2" LancTEc wellhead.
- Installation of five 8" diameter extraction wells. These wells were installed to depths greater than 30'. 4" PVC piping was installed in each well and 2" Lantec wellheads installed.
- Installation of more than 300 feet of 8" HDPE piping from each of the 36" wells. This piping connected each of the wellheads to the main header line. As disturbance of the landfill cap was

LANDFILL GAS EXTRACTION SYSTEM ADDITIONS AND MODIFICATIONS ATLANTA, GEORGIA

of great concern, all piping was installed above ground.

- Installation of more than 300 feet of 4" HDPE piping from each of the 8" wells. This piping connected each of the wellheads to the main header line. This piping was also installed above ground.
- Installation of more than 1200 feet of 4" and 6" HDPE piping from each of the well lateral pipes to the main header running to the onsite flare system. This piping was also installed above ground.
- Installation of two 36" diameter HDPE condensate sumps. Each sump was equipped with a QED AP4 submersible pump.



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GES Personnel	Project Name	Role	Brief Description of Work
Jeff Brown, CHMM	Baseline Landfill Gas System Expansion, Ocala, Florida	Project Manager	Managed expansion of an existing LFG system, including installation of three new gas collection wells and 2,500 feet of collection piping. All existing gas wells at the site were dewatered to increase gas production, temperature monitored at various depths using a data-logger, and video inspected. All main gas headers were video inspected to determine if any blockages existed. All gas collection headers were dewatered and determined to be in good functioning order. The entire well field was tuned and the flare system overhauled and a maintenance program put in place for facility personnel to assume O&M responsibilities.
Dale Carpenter, CHMM	Landfill Remediation, Bloomington Indiana	Project Manager	Project included the excavation and separation of 500,000 cubic yards of TSCA hazardous and non-hazardous soil and debris; hauling and disposal of all hazardous material; consolidation of a 17.6-acre landfill into a 9-acre landfill cap; installation of a 24 inch clay cap with a 40 Mil LLPDE liner and gas collection system; and, re-vegetation and site restoration. Temporary stormwater controls were constructed for use during the project to capture impacted water and sediment prior to it leaving the site and treating the water in an onsite water treatment plant to remove solids and PCBs. A series of drainage ditches and swales channeled the water to a constructed stormwater pond from which water was pumped into 50,000 portable pools, then pumped through the treatment system prior to discharge to the POTW.
Dale Carpenter, CHMM	Landfill Remediation, Bloomington, Indiana	Project Manager	The project included excavation and segregation of PCB-impacted soil and debris, off site transportation and disposal of the PCB material, and consolidation of the non-impacted waste into a smaller footprint, then capping the site with an engineered cap consisting of 40-mil HDPE liner and 2 feet of compacted clay. During the project, stormwater was captured and treated on site prior to being released to the POTW. Over 4 million gallons of water was treated over the duration of the project.
Dale Carpenter, CHMM	Landfill Cell Remediation and Construction, Polk County, Florida	Project Manager	This project involved the construction of a 45-acre, FDEP-approved municipal landfill cell. Site activities included grading and construction of cell berms, placement of 7" sand and clay layers, 3 layers of liner, leachate collection system, and placement of a 24" layer of protective sand layer. Additional off-site activities include construction of 2 stormwater retention ponds, ditches and culverts.
David Wheeler, CHMM	Landfill Gas Extraction System, Fulton County, GA	Project Manager	Mr. Wheeler was responsible for overall project management for construction of this landfill gas extraction system. Responsibilities included day to day management of onsite operations, controlling the budget and schedule, and assuring client satisfaction. The project involves the installation of 68 methane

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			gas extraction wells, installation of a condensate recovery system, and the installation of 17,500 feet of HDPE header and lateral piping from the wells to an existing flare system. Mr. Wheeler implemented several value-added options on the project, saving the client time and money.
David Wheeler, CHMM	Landfill Gas System Expansion, Johnson City, TN	Project Manager	Mr. Wheeler was responsible for overall project management for this design/build landfill gas extraction system. Responsibilities included budget control, client relations, regulatory compliance, day to day operations and schedule maintenance. The project involves the installation of three extraction wells, the conversion of four leachate collection risers into gas wells, the installation of 2500 feet of HDPE header and lateral piping, and installation of a landfill gas flare system. Mr. Wheeler was able to save the client over \$40,000 on the construction of the system by working with the design team to develop and institute field changes to the system.
Sam McCowan	Landfill Remediation Fulton County, GA	Project Supervisor	Responsible for the daily operation and maintenance of the (73) seventy-three extraction well system with an enclosed flare. Perform monthly and quarterly service and inspections on air compressor and flare unit.
Sam McCowan	Landfill Remediation Macon, GA	Project Supervisor	Responsible for the Title V compliance requirements of a (83) eighty three extraction well system with a gas compressing unit for fuel generation, responsibility's include the monthly extraction well head readings, perform quarterly surface emission testing on site.
Sam McCowan	Landfill Gas System Fayetteville, GA	Project Supervisor	Responsible for the installation of a (55) fifty five point soil vapor extraction system tied into the landfill gas extraction system to reduce off site gas migration in parameter methane and ground water wells.
Sam McCowan	Landfill Remediation Atlanta, GA	Project Supervisor	Responsible for assisting the City with the operation and maintenance of a (53) fifty three extraction well field and the enclosed flare system.
Sam McCowan	Landfill Gas System Buford, GA:	Project Supervisor	Responsible for the installation of a (64) sixty four point soil vapor extraction system tied into the landfill gas extraction system to reduce off site gas migration in perimeter methane and ground water wells.
Clayton Sturgeon	Landfill Remediation Irwinton, GA	Project Manager	Installation of two 36" diameter extraction wells; abandoned six gas monitoring points; onsite fabrication & installation of 3 HDPE condensate sumps and installation of new gas flare system.

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Doug Snyder	Landfill Gas System Augusta, GA	Project Manager	Conversion of an existing passive gas venting system to an active vacuum assisted gas extraction system. Converted 33 gas vents to active extraction wells, installed three condensate sumps and vacuum blower. Greenleaf currently is under contract to maintain this system.
Sam McCowan	Landfill Remediation Macon, GA	Project Manager	Greenleaf is under contract to maintain and tune gas wellfield and flare system.
Sam McCowan	Landfill Remediation Atlanta, GA	Project Manager	Installation of new HDPE piping and wells to expand existing gas system.

MSW LANDFILL LANDFILL GAS EXTRACTION SYSTEM WILKINSON COUNTY, GEORGIA

PROJECT MANAGER
Clay Sturgeon

PERFORMANCE PERIOD
November 2006 – February 2007

CONTRACT VALUE
\$234,000

PURPOSE

Construct a methane extraction and flare system on a closed MSW landfill.

HISTORY

The closed MSW Landfill is located in Wilkinson County, Georgia. The site had been closed and capped for several years. Greenleaf competitively bid the work to install a gas extraction and flare system designed by Hulsey, McCormick and Wallace, Inc., the County's engineer.

PROJECT APPROACH

The scope of the work performed included:

- Installation of two 36" diameter extraction wells. These wells were installed to depths of 30 to 40 feet. 6" HDPE piping was installed in each of the wells. One existing well was also included in the system. Each well was fitted with a 2" LanTec wellhead.

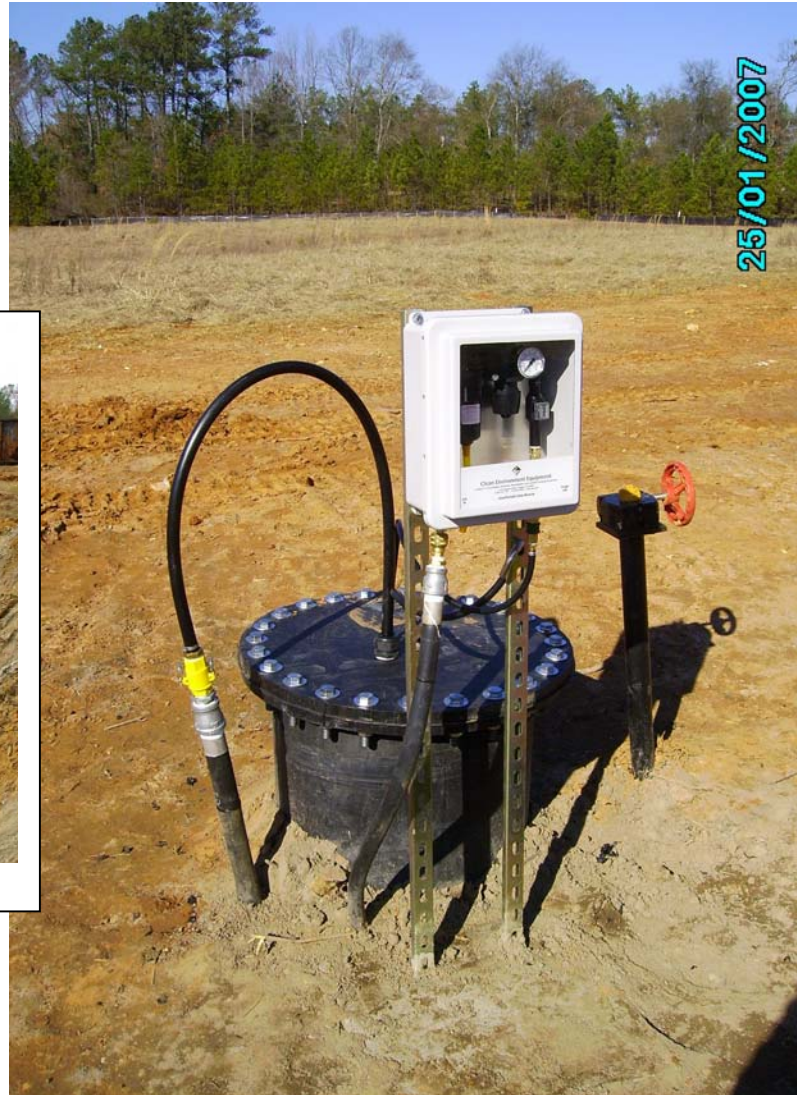


- GES abandoned six 2-inch PVC landfill gas monitoring points by over-drilling and tremie grouting to land surface.
- Three HDPE condensate sumps were field fabricated and installed. The original design called for electric pumps in the sumps. GES recommended switching to QED pneumatic AP-4 pumps, and installing an air compressor to run the pumps. This provided for a more intrinsically safe design and overall less maintenance of the pump system.
- Installation of more than 800 feet of 6" HDPE piping from each of three extraction wells. This piping connected each of the wellheads to the main header line. As disturbance of the landfill cap was of great concern, all piping was installed above ground.
- Installation of more than 800 feet of 1.5" HDPE piping from each of the three condensate sumps. This piping connected each of the AP-4

MSW LANDFILL LANDFILL GAS EXTRACTION SYSTEM WILKINSON COUNTY, GEORGIA

condensate sumps to the main condensate holding tank.

- Construction of a flare pad, air compressor building and pad and a propane tank pad.
- Procurement and installation of an LFG skid mounted flare system, including electrical drop and connection, connection to landfill gas header, connection to propane tank and telemetry system.



Results

All work was completed ahead of schedule, and even though the project was a firm fixed price contract, GES was able to reduce the total project cost to the client through value engineering certain components of the system.